

Predicting Trapezoidal Weir Discharge Coefficient Using Evolutionary Algorithm

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Abstract : Weirs are structures often used in irrigation techniques, sewer networks and flood protection. However, the hydraulic behavior of this type of weir is complex and difficult to predict accurately. An accurate flow prediction over a weir mainly depends on the proper estimation of discharge coefficient. In this study, the Genetic Expression Programming (GEP) approach was used for predicting trapezoidal and rectangular sharp-crested side weirs discharge coefficient. Three different performance indexes are used as comparing criteria for the evaluation of the model's performances. The obtained results approved capability of GEP in prediction of trapezoidal and rectangular side weirs discharge coefficient. The results also revealed the influence of downstream Froude number for trapezoidal weir and upstream Froude number for rectangular weir in prediction of the discharge coefficient for both of side weirs.

Keywords : discharge coefficient, genetic expression programming, trapezoidal weir

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